Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A process for automatically altering the data rate on a logical channel ~~with changing noise conditions,~~ comprising ~~the steps~~:

1) resetting a flawed packet counter for said logical channel in response to changing noise conditions on the logical channel;

2) resetting a total packets received counter for said logical channel;

3) receiving a packet on said logical channel, and incrementing the total packet received counter;

4) processing error detection data in said packet to determine if there is an error in the packet, and, if so, incrementing said flawed packet counter;

5) comparing the count in said total packet counter to a number representing the desired number of packets to be received before a ~~determine~~ determination of packet loss percentage is made;

6) if the number of packets received is less than the desired number, returning to step 3;

7) if the number of packets received is equal to or exceeds the desired number of packets received, calculating a packet loss percentage by dividing the number of flawed packets by the total number of packets received;

8) comparing the packet loss percentage calculated in step 7 to one or more packet loss thresholds;

9) determining if a change in ~~date~~ data rate throughput is required based upon the comparison(s) made in step 8;

10) if a change in ~~date~~ data rate throughput is required, generating a signal indicating the need for a change in data rate for said logical channel.

2. (Currently amended) The process of claim 1 further comprising the steps of determining in step 3 ~~if~~ whether an incoming packet is transmitted in response to a contention grant, and, if said packet is transmitted in response to a contention grant, discarding said packet and not incrementing the packet received counter or the flawed packet counter, and further comprising a step 11 comprising the substeps of either selecting a new burst profile with an appropriate ~~date~~ data rate throughput and generating and transmitting a upstream channel descriptor message setting new data rate throughput parameters of said selected burst profile, or selecting a new burst profile and generating a visible or audible notification to a system operator informing of the
need for a change in data rate throughput and suggesting the new burst profile that should be used, and returning to step 1 for a new logical channel.

3. (Original) The process of claim 1 further comprising a step performed before any processing to determine if an operator has turned automatic rate adaptation on for all logical channels.

4. (Original) The process of claim 1 further comprising a step performed before any processing to determine if an operator has turned automatic rate adaptation on for the particular logical channel to be processed.

5. (Original) The process of claim 1 further comprising the step of generating an upstream channel descriptor message having descriptor data that defines a data rate that is different from the existing data rate of said logical channel and appropriate to the currently existing noise conditions, and transmitting said upstream channel descriptor message at least to all cable modems that may be assigned to use said logical channel.

6. (Original) The process of claim 1 further comprising the steps:

if step 9 determines that a change in data rate throughput is not required, returning to step 1 and begin processing for a new logical channel; and

if step 10 determines that a change in data rate is required, selecting a new burst profile with a data rate which is changed appropriately for the current noise conditions on said logical channel, and generating and transmitting an upstream channel descriptor message that contains data that controls cable modems to transmit using the changed data rate.

7. (Currently amended) The process of claim 1 wherein steps 8 and 9 further comprise:

A) first comparing said packet loss percentage to a first threshold and calculating said first threshold by evaluating the expression:

packet_loss_required * (1 + TH1)

where packet_loss_required is a programmable number representing the desired maximum packet loss percentage and TH1 is a constant representing a first hysteresis threshold;

B) if said packet loss percentage is greater than or equal to said first threshold, making the determination that a reduction in data rate is required and proceeding to step ~~11~~ 10;

C) if said packet loss percentage is not greater than or equal to said first threshold, comparing said packet loss percentage to a second threshold and calculating said second threshold by evaluating the expression:

packet_loss_required * (1- TH2)

where packet_loss_required is a programmable number representing the desired maximum packet loss percentage and TH2 is a constant representing a second hysteresis threshold;

D) if said packet loss percentage is less than or equal to said second threshold, making the determination that an increase in data rate is required and proceeding to step ~~11~~ 10;

8. (Currently amended) The process of claim 7 further comprising the steps:

if step D determines that said packet loss percentage is greater than said second threshold, picking a new logical channel~~, and repeating the process steps in claims 1 and 7 and this claim 8~~.

9. (Currently amended) A process for automatically altering the data rate on a logical channel ~~with changing noise conditions,~~ comprising ~~the steps~~:

1) resetting an average noise filter or accumulator or memory location for said logical channel in response to changing noise conditions on the logical channel;

2) resetting a total packets received counter for said logical channel;

3) receiving a packet on said logical channel, and incrementing the total packet received counter if said packet is not transmitted in response to a contention grant and discarding said packet if it is transmitted in response to a contention grant;

4) processing a received packet to determine the average noise if the packet has not been discarded and updating a running average noise value using the average noise in the packet;

5) comparing the count in said total packet counter to a number representing the desired number of packets to be received before a determination of channel signal-to-noise ratio is made;

6) if the number of packets received is less than the desired number, returning to step 3;

7) if the number of packets received is equal to or exceeds the desired number of packets received, calculating the signal-to-noise ratio (hereafter SNR) of said logical channel;

8) comparing the SNR calculated in step 7 to one or more SNR thresholds;

9) determining if a change in ~~date~~ data rate throughput is required based upon the comparison(s) made in step 8;

10) if a change in ~~date~~ data rate throughput is required, generating a signal indicating the need for a change in data rate.

10. (Original) The process of claim 9 wherein step 8 through 10 comprise the following steps:

(A) determine the SNR of the logical channel and then determine if SNR of the logical channel is less than the value SNR_REQUIRED * (1-TH1) where

SNR_REQUIRED is the desired SNR for the logical channel and the burst profile in use TH1 is a constant representing a first SNR threshold;

(B) if the SNR of the logical channel is lower than or equal to the value SNR_REQUIRED * (1-THI), then reducing the data rate of said logical channel;

(C) if the SNR of the logical channel is greater than SNR_REQUIRED * (1 + TH2), then increasing the data rate of said logical channel.

11. (Currently amended) The process of claim 10 wherein step (B) comprises reducing the data rate by selecting the next burst profile down from the currently selected burst profile for the logical channel being processed, said next burst profile down being selected from a table of burst profiles arranged in order of ~~ascending~~ descending data rates.

12. (Original) The process of claim 10 wherein step (D) comprises increasing the data rate by selecting the next burst profile up from the currently selected burst profile for the logical channel being processed, said next burst profile up being selected from a table of burst profiles arranged in order of ascending data rates.

13. (Original) The process of claim 9 wherein step 10 comprises generating a signal which can be seen or heard by an operator suggesting a change in data rate for the channel such that said operator can manually select a new data rate and -cause a new upstream channel descriptor message to be generated and sent if the operators chooses to change the data rate.

14. (Currently amended) A process for automatically altering the data rate on a logical channel ~~with changing noise conditions,~~ comprising ~~the steps~~:

1) resetting a total uncorrectable codeword count for said logical channel for an interval, in response to changing noise conditions on the logical channel;

2) resetting a total codewords received count for said logical channel for said interval;

3) receiving a burst on said logical channel, and adding the total codewords received in the burst to the running total of codewords received for said interval;

4) receiving information regarding the number of uncorrectable codewords in said received burst and adding said number of uncorrectable codewords to a running total of uncorrectable codewords for the logical channel over said interval;

5) determining in any way whether said interval has been completed;

6) if said interval has not been completed, returning to step 3;

7) if said interval has been completed, calculating either the bit error rate or a byte error rate of said logical channel;

8) comparing the error rate calculated in step 7 to one or more thresholds;

9) determining if a change in ~~date~~ data rate throughput is required based upon the comparison(s) made in step 8;

10) if a change in ~~date~~ data rate throughput is required, generating a signal indicating a need for a change in the data rate of said logical channel.

15. (Currently amended) The process of claim 14 wherein step 8 comprises calculating the byte error rate by evaluating the expression

(1) ByteErrorRate = $\frac{(T + 1)*n\_error}{\quad}$

$$(k + 2T) * n\_total$$

where

T is the number of maximum correctable bytes in an Reed-Solomon (hereafter R-S) codeword;

~~T+1 is T +1, i.e., when there is an uncorrectable R-S codeword, there is a high probability of having T+1 flawed bytes;~~

n_error is the total number of uncorrectable R-S codewords for said interval from predetermined ~~IUC~~ interval usage code (IUC) burst type(s);

n_total is the total number of received R-S codewords from predetermined IUC burst type(s) received within said time interval;

k is the number of information bytes in an R-S codeword of a specific IUC; and

~~k+2t~~ (k+2t) stands for: the R-S codeword length in bytes;

and wherein the ByteErrorRate so calculated is compared to a byte error rate threshold.

16. (Currently amended) The process of claim 14 wherein step 8 comprises calculating the byte error rate

by evaluating the expression

$$(2)\ BER = \frac{0.5 * (T+1) * n\_error}{(k + 2T) * n\_total}$$

where

T is the number of maximum correctable bytes in an Reed-Solomon (hereafter FOS) codeword;

~~T+1 is T + 1, Le, when there is an Uncorrectable R-S codeword, there is a high probability of having T+1 flawed bytes;~~

n_error is the total number of uncorrectable R-S codewords in a specific IUC burst within a certain time interval;

n_total is the total number of received R-S codewords of a specific IUC burst within a certain time interval;

k is the number of information bytes in an R-S codeword of a specific ~~IUC~~ interval usage code (IUC); and ~~k+2t~~ (k+2t) stands for: the R-S codeword length in bytes;

and wherein the bit error rate so calculated is compared to a bit error rate threshold.

17. (Currently amended) The process of claim 14 wherein step (10) comprises reducing the data rate by selecting the next burst profile down from the currently selected burst profile for the logical channel being processed, said next burst profile down being selected from a table of burst profiles arranged in order of ~~ascending~~ descending data rates and generating and transmitting downstream and upstream channel descriptor message containing the parameters for transmission on said logical channel including parameters which set said new data rate.

18. (Original) The process of claim 14 wherein step (10) comprises increasing the data rate by selecting the next burst profile up from the currently selected burst profile for the logical channel being processed, said next burst profile up being selected from a table of burst profiles arranged in order of ascending data rates and generating and transmitting downstream and

upstream channel descriptor message containing the parameters for transmission on said logical channel including parameters which set said new data rate.

19. (Original) The process of claim 14 wherein step 10 comprises generating a signal which can be seen or heard by an operator suggesting a change in data rate for the channel such that said operator can manually select a new data rate and cause a new upstream channel descriptor message to be generated and sent if the operators chooses to change the data rate.

20. (Original) A process comprising:

1) automatically determining the prevalent type of noise on a logical channel and selecting a group of burst profiles suited to the type of prevalent noise on said logical channel;

2) selecting an initial burst profile for said logical channel;

3) determining a quality of channel parameter for said logical channel;

4) comparing said quality of channel parameter to one or more thresholds;

5) determining based upon said comparison(s) made in step 4 whether a change in bit rate on said logical channel is recommended.

21. (Original) The process of claim 20 wherein step 2 comprises computing a signal-to-noise ratio for said logical channel and selecting said initial burst profile based upon said signal-to-noise ratio.

22. (Original) The process of claim 20 wherein step 3 comprises calculating a packet loss percentage, signal-to-noise ratio, bit error rate or byte error rate.

23. (Original) The process of claim 20 wherein step 4 comprises comparing said quality of channel parameter to an upper threshold limit, and, if said quality of channel parameter is less than said upper threshold limit, comparing said quality of channel parameter to a lower threshold limit.

24. (Currently amended) The process of claim 20 further comprising the step of automatically selecting a new burst profile with a higher or lower bit rate, as appropriate, if step 5 leads to a conclusion that a new bit rate is recommended, and automatically generating and sending ~~a UCD~~ an upstream channel descriptor (UCD) message containing the burst parameters cable modems transmitting on said logical channel must adopt for their upstream transmissions.

25. (Original) The process of claim 20 further comprising the step of generating a message to a cable operator that a change in bit rate is recommended if step 5 leads to the conclusion that a change in bit rate on said logical channel is recommended.

26. (Original) A process carried out in a cable modem termination system comprising the steps:

(1) powering up and measuring the signal-to-noise ratio (SNR) on a channel prior to transmitting any downstream grant messages authorizing cable modems to transmit on said channel;

(2) selecting an initial burst profile from a table of burst profiles appropriate to said channel based upon a mode of operation of said channel, said selection based upon said SNR of said channel;

(3) monitoring SNR of said channel and a rate that impulse noise is detected on said channel;

(4) comparing the amount of impulse noise erasures to one or more erasure thresholds and deciding whether said logical channel is dominated by Average White Gaussian Noise (AWGN) or impulse noise, and selecting an appropriate set of burst profiles for said channel based upon the dominant noise type;

(5) after cable modems start transmitting on said channel, determining a packet error rate for packets transmitted on said channel;

(6) comparing the packet error rate to one or more thresholds and deciding whether a change in bit rate on said channel is advisable to bring said packet error rate within predetermined limits;

(7) if a change is bit rate is indicated by step (6), automatically picking a new burst profile with an appropriately changed bit rate from said set of burst profiles selected in step 4.

27. (Original) The process of claim 26 wherein step 4comprising comparing said amount of impulse noise erasures to an upper limit threshold to determine when a channel has become dominated by impulse noise, and comparing said amount of impulse noise erasures to a tower limit to decide when said channel has become dominated by AWGN, said upper and lower thresholds being separated by an amount sufficient to provide a hysteresis effect.

28. (Original) The process of claim 26 wherein step 6 comprising comparing said packet error rate to an upper limit threshold to determine when a channel should have its bit rate lowered, and comparing said packet error rate to a lower limit to decide when said channel should

have its A rate increased, said upper and lower thresholds being separated by an amount sufficient to provide a hysteresis effect.

29. (Original) The process of claim 26 wherein step 7 further comprises automatically generating and sending an upstream channel descriptor message which includes parameters set by said new burst profile so as to cause cable modems transmitting on said channel to alter their bit rates.

30. (Original) The process of claim 26 wherein step 7 further comprises sending a message to said cable operator indicating it would be desirable to manually change said bit rate.

31. (Currently amended) The process of claim 26 further comprising the steps:

(8) repeating steps 3 through 7 until either said packet error rate has been brought within acceptable limits or a maximum number of attempts have been made;

(9) if a maximum number of attempts have been made without success in bringing the ~~PER~~ packet error rate (PER) within limits, jumping to another logical channel by sending new bandwidth allocation map (MAP) ~~MAP~~ messages to all ~~CMs~~ cable modems (CMs) that have been using the logical channel for which the *PER* cannot be brought within limits instructing said CMs when they may transmit on the new logical channel and, if necessary,

sending an upstream channel descriptor message defining the characteristics and burst profile of said new logical channel.

32. (Currently amended) A cable modem termination system ~~programmed to execute~~ configured to execute a media access control process, ~~and wherein~~ comprising:

~~said media access control process contains~~ means for automatically sensing the quality of a channel; and

means for making a decision regarding whether a change in bit rate on said channel should be implemented based upon the quality of said channel.

33. (Currently amended) The cable modem system of claim 32 wherein said means for automatically sensing includes means for ~~senses~~ sensing the quality of a channel by determining a quality factor related to the packet error rate, ~~and~~ automatically ~~selects~~ selecting a new bit rate and ~~generates and sends~~ generating and sending an upstream channel descriptor message to change the burst profile and bit rate appropriately for said channel based upon changes in said packet error rate.

34. (Currently amended) The cable modem system of claim 32 wherein said means for automatically sensing includes means for ~~senses~~ sensing the quality of a channel by determining a quality factor related to the packet error rate, and automatically ~~generates~~ generating a message to advise a cable operator to manually change the burst profile and bit rate appropriately for said channel based upon changes in said packet error rate.